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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/469,715	12/21/1999	JAMES M. GARDNER	CISCP647	5302

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EXAMINER	
NGUYEN, HANH N	
ART UNIT	PAPER NUMBER
2662	11

DATE MAILED: 03/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/469,715	GARDNER ET AL.	
	Examiner	Art Unit	
	Hanh Nguyen	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Amendment filed on 12/19/03* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6,8-10,13 and 15* is/are rejected.

7)☒ Claim(s) *4, 5, 7, 11, 12 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *6* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

Claims 1, 8 and 15 are objected to because of the following informalities:

Applicant is required to fully describe the OFDM. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 6, 8, 10, 13 and 15 are rejected under 35 USC 103(a) as being unpatentable over **Shirakata et al.** (US pat. No. 6,618,352 B1) in view of **Lee** (US Pat. No. 6,373,861 B1).

In claims 1, 3, 8, 10 and 15, **Shirakata et al.** discloses, in Fig.15, an OFDM receiver 140 (a second node) that receives a time domain OFDM signal So' (see Fig.1) from an OFDM transmitter 120 (a first node) (receiving time domain OFDM bursts from the first node at the second node). See col.11, line 65 to col.12, line 5. The time domain signal So' is transformed into frequency domain signal Sf by FFT circuit 5 (converting the time domain OFDM burst to frequency domain OFDM burst). See col.16, lines 10-15 & Fig.1. The OFDM receiver 140 uses phase difference calculating unit 8d (see fig.4) to obtain phase difference Pd betwen the received signal Rpc and transmit signal Spc (determining inter-burst phase differences). See col.16, lines 52-60 & Fig.4. **Shirakata et al.** does not discloses determining coarse frequency offset between the first node and the second node based on the phase differences. **Lee** discloses, in Fig.5, an

OFDM frequency synchronizing device 200 calculating coarse frequency offset based upon signal output from ADC 162 (determing coarse frequency offset). See col.6, line 55 to col.7, line 5. The synchronizing device 200 receives OFDM frame (burst) including symbols (burst including symbols). Each symbol comprises a guard interval (cyclic prefix) inserted at the head of each symbol to prevent interference. See Abstract.

Since **Lee** teaches a frequency synchronizing device between a transmitter and a receiver in OFDM system, therefore; it would have been obvious to one ordinary skill in the art to modify the receiver of **Shirakata et al.** by having the frequency synchronizing device of **Lee** so as to determine the phase differences and frequency offset between the transmitter and the receiver. The motivation is to provide frequency synchronization at a second node.

In claims 6 and 13, **Shirakata et al.** does not disclose varying a receive frequency of second node to correct the coarse frequency offset. **Lee** discloses, in Fig.5, an OFDM frequency synchronizing device comprising a frequency corrector 161 that compensates for a frequency offset of the filtered data (correcting frequency offset). See col.6, lines 57-65. Therefore, it would have been obvious to modify the receiver of **Jones** by having a frequency corrector of Lee so as to correct frequency offset. The motivation is to provide frequency synchronization at a second node.

Claims 2 and 9 are rejected under 35 USC 103(a) as being unpatentable over **Shirakata et al.** (US pat. No. 6,618,352 B1) in view of **Lee** (US Pat. No. 6,373,861 B1), and further in view of **Schmidl et al.** (US pat. No. 5,732,113).

In claims 2 and 9, **Shirakata et al.** does not discloses the selected symbols comprising training symbols. **Schmidl et al.** discloses, in Fig.6, data frame 130 (burst) comprising symbols 1-3, each comprising training symbols 134, 136, 138a respectively (symbols having traning symbols). The symbol 1 contains zeroes (symbol containing values). See col.4, lines 55-67 & col.11, line 60 to col.12, line 10. T herefore, it would have been obvious to one ordinary skill in the art to have training symbols in the received signal of **Shirakata et al.** to assign a user signal to a training symbol.

Allowable Subject Matter

Claims 4, 5, 7, 11, 12 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

In claims 4 and 11, the prior art does not disclose determining fractional symbol width frequency offset based on correlating the supplemental cyclic prefix to a corresponding of N time domain symbols.

In claims 7 and 14, the prior art does not disclose the received frequency is varied to correct the fractional symbol width offset prior to determining small integer symbol width frequency offset and coarse frequency offset.

Response to Arguments

Applicant's arguments with respect to claims 1-3, 6, 8-10, 13 and 15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Mesiwala (US Pat. No. 6,097,776) discloses Maximum Likelihood Estimation of Symbol Offset.

Katsumoto (US Pat. No. 6,501,730 B1) discloses Carrier Recovery in DAB Receivers.

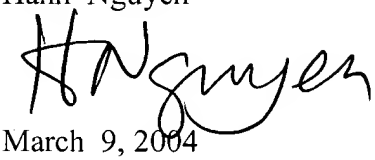
Schmidl et al. (US Pat. No. 6,546,055 B1) discloses Carrier Offset Determination for RF Signals Having a Cyclic Prefix.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh Nguyen whose telephone number is 703 306-5445. The examiner can normally be reached on Monday-Friday 8:30 AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 703 306-4744. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9314 for regular communications and 703 308-9051 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-4700.

Hanh Nguyen



March 9, 2004